Veco 19 BB STD



Rugged crankcase and high power output should make the Veco 19-BB a firm favourite as seen in the heading photograph, a radio version is also available.

The Veco 19 BB belongs to a diminishing breed of engine: the high-performance, high-quality, all-rounder which can be switched from one kind of model to another. In these days of increasing specialisation, there are very few motors that can be regarded as particularly well suited to more than one or two types of model. By contrast, we can think of four or five applications in which the Veco can be expected to be competitive.

For example, fitted with the standard venturi insert and Veco No. 107 glow plug supplied, and running on suction feed and a mild fuel, the 19-BB makes an excellent modern successor to the 3.5 c.c. diesels that used to be much favoured by British modellers for C/L stunt flying with medium size models. In this same state of tune, the Veco's even and useful performance at medium r.p.m. i.e. its ability to pull a fine pitch 10 or 11 inch prop would be suitable for a sport type or scale free flight model.

In contrast, the 19-BB can also be a very potent power-unit for open type power-duration contests. For this, one substitutes the special large bore venturi (identifiable by its red anodised finish), installs a pressurised fuel system with the aid of the back plate pressure take off fitting (both optional extras) and, by running on the hottest fuel available, one has an engine, compact and not too heavy, capable of outperforming all but the best international class free flight motors.

Peter Chinn's

Engine Test

VECO 19-BB

"Easy-handling, high performance motor."
"The overall handling qualities of the Veco 19-BB on test were extremely good."

Finally, if our C/L - F/F enthusiasts' interests should later turn to radio-control, the Veco can have yet another lease of life. The manufacturer makes a special R/C version of the 19-BB, but the only real difference between the models is in the addition of a coupled throttle system and a shielded type glow plug and conversion is therefore relatively simple. The production 19BB-R/C has the crankcase modified to accept the throttle type carburetor and semi-rotary exhaust restrictor and, of course, a replacement crankcase, in addition to the throttle parts, could be purchased, but it is quite easy (and a lot cheaper) to modify the existing crankcase. This can be effected by shortening the intake boss by approximately 13/64 in., so that the R/C carburetor can drop down into the correct position, where it is held in place by two grub screws through the standard spray bar holes. Incidentally, it is only necessary to purchase the actual throttle parts since the same needle-valve assembly is used in both versions. If preferred, the exhaust duct can be drilled, reamed and faced to accept the exhaust restrictor, but this is not essential since, in the U.K., a silencer will normally be required and the coupled exhaust restrictor can, in these circumstances, be omitted. The Veco Products Corporation do not, as yet, offer silencers for their engines, but we understand that silencers suitable for the 19-BB can be obtained to order from D.A.C. Components of Horsham, Sussex, makers of "Spinaflo" and "Mufflo" silencers.

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Above, parts of the Veco 19-BB. Note the size of the crankshaft journal, unusually large (12 mm) in a ball-bearing engine of this displacement.

Construction

The Veco 19-BB is unique among current .19 class engines in that it combines a large (12 mm.) diameter crankshaft (with appropriate gain in gas passage cross- sectional area), with a ball journal main bearing. Using standard ball bearing sizes it would be impracticable to accommodate the outside diameter of a 12 mm. i.d. bearing within a 19 size crankcase, but by virtue of a special arrangement between Veco Products and the Fafnir Bearing Company, this difficulty was overcome in the case of the 19-BB. Fafnir actually make a special type of rear bearing for the Veco 19-BB, an arrangement that was not entirely unconnected with the fact that an influential member of the Fafnir staff happens to be a keen R/C enthusiast. The front, reduced diameter, end of the shaft is also carried in a ball-bearing; in this case a standard ¼ in. i.d. bearing with 5/8 in. o.d.

The crankshaft itself is heavily counterbalanced by means of a crescent counterweight plus cutaway web flanks each side of the crankpin. The intake passage through the shaft is very large, for a 3¼ cc. engine, at 0.340 in. bore and is fed from a large rectangular valve port and parallel sided main bearing aperture. These give a total intake period of 190 degrees of crank rotation, timed, according to measurement of our test sample, to open at 34 deg. ABDC and to close at 44 deg. ATDC.

The cylinder ports are of moderate area, each being divided by a centre bar and radiused at the ends. The exhaust port opens at 70 deg. BBDC and the transfer port 8 degrees later. No cylinder offset is used and exhaust and scavenge periods are, therefore, 140 degrees and 124 degrees respectively. The cylinder liner, which is of unhardened leaded steel, has a wall thickness of 0.058 in. and is located by a flange at the top with a 0.012 in. soft aluminum gasket between the top of the cylinder barrel and the underside of the liner flange. A 0.015 in. soft aluminum gasket is used to make the joint between the top of the liner flange and the cylinder head which is recessed for this purpose.

The piston is of an inoculated cast-iron similar to Meehanite, hardened by heat treatment and with the fitted skirt area extending from just below the crown to immediately below the gudgeon-pin holes. A good, stiff connecting rod, with ample small end bearing area and a phosphor-bronze bushed big end, is used and is coupled to the piston by a fully-floating hardened tubular gudgeon pin with brass pads.

The complete engine is strongly made and standards of fits and finishes are good.

Performance

The overall handling qualities of the Veco 19-BB on test were extremely good.

Firstly, the engine called for very little running-in time. Our test model was given a nominal two hours but was, for all practical purposes, run-in after less than one hour. Slight variation may be expected between individual examples of the 19-BB but at no time should these motors call for tediously long periods of running-in.

Secondly, starting was very easy. Starts were quickly obtained using orthodox procedure, i.e. an exhaust prime when cold; intake choking when warm.

One handling characteristic that is worth mentioning, is that the needle valve, while not sensitive in so far as the engine will start and run on a wide range of settings, does need to be

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adjusted carefully for maximum performance, especially when the engine is propped for speeds below 12.000 r.p.m. This is because the Veco takes several seconds to respond to any needle-valve readjustment. Accordingly, when tuning the needle, sufficient time should be given for the engine to respond to a new setting before a further adjustment is made.

On test, with the engine in perfectly stock condition i.e. fitted with the standard venturi insert and running on suction feed the 19-BB recorded a maximum torque of 29 oz. in. at 11.000 r.p.m. and a maximum power of over 0.38 b.h.p. at approximately 15.500 r.p.m. Having regard to the fact that the engine was also using an economical grade of fuel, this is extremely good.

A somewhat higher level of performance is possible by burning a high nitromethane content fuel and replacing the standard venturi with the optional large bore red venturi, plus pressure feed. We checked the engine in this condition also (using 50 per cent nitro) and gained up to 1.000 r.p.m. on various props. Actual prop r.p.m. achieved under these conditions included 11.000 on a 10 x 4 Tornado, 11.900 on a 9 x 5 Top Flite wood, 12.800 on a 9 x 4 Tornado, 14.000 on an 8 x 5 Power Prop. Except for open free-flight contests, however, it is clear that the performance of the engine is fully adequate in normal trim and running on mild fuel.

Veco engine sales in the U.K. are handled by Ripmax Ltd. The 19-BB is not a cheap engine, but for anyone who wishes to obtain an easy-handling, high-performance motor that is also sufficiently versatile to suit a number of different types of models and which, moreover, can be expected to outlast several such models, it could prove to be a very good buy.

Power I Weight Ratio (as tested): 0.98 b.h.p./lb.

Specific Output (as tested): 116 b.h.p./litre

SPECIFICATION

Type: Single-cylinder, air-cooled, loop-scavenged, two- stroke cycle, glow plug ignition, with ball-bearing crankshaft. Shaft type rotary-valve induction.
Bore: 0.634 in.
Stroke: 0.633 in.
Swept Volume: 0.1998 cu. in. = 3.274 c.c.
Stroke/Bore Ratio: 0.998 : 1
Weight: 6.2 oz.

General Structural Data

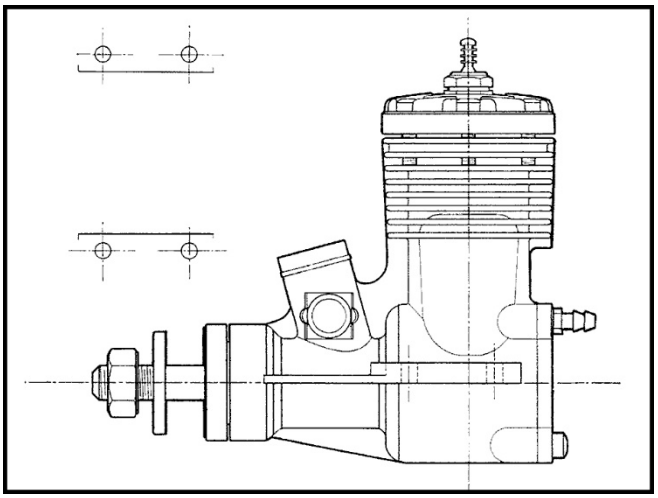
Pressure die cast aluminum alloy crankcase/cylinder- block/front housing with drop-in unhardened leaded steel cylinder-liner. Case-hardened steel counterbalanced crankshaft with 12 mm. main journal and 0.187 in. dia. crankpin and mounted in two Fafnir ball journal bearings. Pressure die cast aluminum alloy prop driver keyed to crankshaft with 1/16 in. square sunk key. Heat-treated cast- iron piston with flat crown and baffle and internal stiffening rib. Connecting-rod machined from extruded aluminum alloy with pressed-in phosphor-bronze big-end bearing. Fully-floating 0.156 in. dia. tubular gudgeon-pin. Pressure die cast aluminum alloy cylinder-head with glow plug offset to exhaust side and recessed for soft aluminum gasket. Head secured to main casting with six Phillips screws. Pressure die cast aluminum alloy crankcase rear cover secured with four Phillips screws. Removable 0.235 in. bore aluminum venturi insert with rubber sealing ring and retained by plated brass spray bar assembly having hardened steel needle-valve seat. Optional 0.295 in. bore venturi and optional back plate nipple for operation on pressurised fuel supply. Beam mounting lugs.

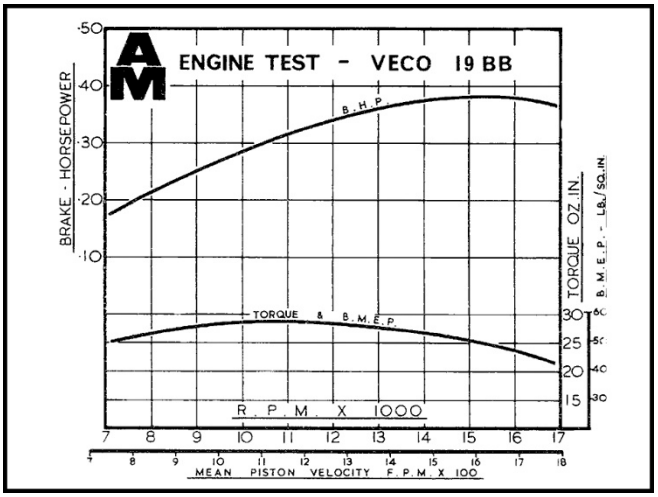
TEST CONDITIONS

Running time prior to test: Approximately 3 hours.
Fuel used: 5 per cent nitromethane, 25 per cent Duckhams Racing Castor-Oil, 70 per cent I.C.I. Methanol.
Glow plug used: Veco No. 107, 1.5 volt platinum filament, long reach, as supplied.
Fuel system: Standard venturi insert as fitted, suction feed.

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Air Temperature: 50 deg. F.
Barometer: 29.95 in. Hg.
Silencer Type: Nil (see text).





More: https://flyinghlsat.com/search.php?search_keywords=Veco-Tests